

ENGLISH TRANSLATION OF JP 11-230048

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[0010] That is, a chemical liquid supplying device according to the present invention includes: a housing, whose one end is provided with an inflow-side joint portion and whose other end is provided with an outflow-side joint portion, and inside which an accommodating chamber is formed; an expansible-contractible flexible tube, both end portions of which are fixed to the inflow-side and outflow-side joint portions and which is disposed in the accommodating chamber, the tube being formed of an elastic material; a pump supplying a pressurized medium to a space between the flexible tube and the housing to expand and contract the flexible tube, wherein the flexible tube is formed by cylindrical fixture end portions attached to the respective joint portions, taper parts inside the respective fixture end portions, and a flat part between the taper parts, wherein bent parts that have been inwardly or outwardly deformed are formed at width-directional center portions of the flat part, and wherein an entirety of the flat part in the flexible tube is deformed by a pressure of the pressurized medium.

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[0013] FIG. 1 is a sectional view showing a chemical liquid supplying device according to one embodiment of the present invention, and a housing 10 in the device has: a cylindrical main body portion 11 with an accommodating chamber therein; an inflow-side joint portion 12 provided at one end thereof; and an outflow-side joint portion 13 provided at the other end thereof. A supply-side flow path 14 is connected to the inflow-side joint portion 12, and the supply-side flow path 14 is connected to a chemical liquid tank 15 serving as a chemical-liquid accommodating portion. An outflow-side flow path 16 is connected to the inflow-side joint portion 13, and the outflow-side flow path 16 is connected to an application nozzle 17 serving as a chemical-liquid discharging portion. When a photo-resist liquid is applied to a surface of a semiconductor wafer from the application nozzle 17, the photo-resist liquid is received inside the chemical liquid tank 15.

[0014] The supply-side flow path 14 is provided with a supply-side opening/closing valve 18 for opening and closing the supply-side flow path, and the outflow-side flow path 16 is provided with an outflow-side opening/closing valve 19 for opening and closing the outflow-side flow path. As each of the opening/closing valves 18 and 19, a solenoid valve actuated by electrical signals, or an air operating valve actuated by air pressure may be used, or further a check valve may be used.

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[0017] A space between the flexible tube 21 and the housing 10 is a pressurized chamber 22, and an incompressible fluid or fluent material, such as a liquid, as a pressurized medium M is supplied to the pressurized chamber from a supply port 23 formed in the housing 10. In order to expand and contract the flexible tube 21 by supplying the pressurized medium M into the pressurized chamber for pressurization and by exhausting it for suction, the pump 24 is connected to the support port 23 through a flow path 25. A bellows 28, which has become expansible and contractible by a driving rod 27, is incorporated into a pump housing 26 of the pump 24, and the driving rod 27 is reciprocated by driving means such as an electric motor or actuator, whereby the flexible tube 21 is expanded and contracted.

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Main Symbols

10 … housing; 11 … main body portion; 12 … inflow-side joint portion; 13 … outflow-side joint portion; 21 … flexible tube; 21a … fixture end portion; 21b … taper part; 21c … flat part; 61 … collapsed part; and 62 … bent part